the result that in some cases there are European half-siblings also available for study. The term "mulatto" is used by the authors to denote any mixture between Europeans and coloured people.

The children of this study, ranging from eight to twelve years of age, have been well cared for, and live in institutions in Anzio and Rome. One unfortunate setback to this research is the fact that the fathers are only *presumed* to have been in most cases negro soldiers of the occupation period 1943-48. For this reason Professor Gedda has had to assess the probable ethnic make-up of most of the fathers purely from the morphological and pigmentary evidence of the children—a procedure obviously open to error. However, they were able to show that thirty-five boys and girls are likely to be "negro-white" hybrids, six children were thought to be "mongoloid-white" and three were classified as "Polynesian-Italian" or "American Indian-Italian" crosses.

The book is divided into two parts. In the first section the anthropological and medical analyses are given in detail. Anthropometric measurements employed included height, weight, chest circumference, nasal index, cephalic index, and some sixteen other dimensions. Generally the data confirmed previous work and showed the hybrids in an intermediate position to the two parental stocks. Pigmentation was obviously an important aspect, being recorded for the skin, iris, and hair. It is a pity that skin and hair colours were not recorded in terms of reflectance values, a method which can record differences in such a precise fashion, and which is being used to some extent in other hybrid studies. Other physical methods include radiographic studies and electroencephalograms.

Observations on the blood groups, blood sugar, basal metabolism and PTC taste ability were also made.

The data provided further evidence that certain diagnostically important features in ethnic differentiation—such as hair form—behaved dominantly in the crossing of such divergent types. Anthropometric measurements and degree of pigmentation assumed more intermediate positioning to the parents.

Some evidence of heterosis was also suggested, for weight and certain other body dimensions, although the sample sizes were far from adequate to be confident on this point. Acceleration of the growth processes was also claimed, but here again the numbers of both the hybrid and comparative series were small.

The second part of the book consists of detailed information regarding each individual and a useful bibliography.

The book is pleasantly set out, and makes a very welcome addition to the study of hybrids. A considerable handicap to the work has been the lack of information regarding the male parents. Whether the data is better suited to a smaller more compact monograph rather than a somewhat expensive book is rather debatable.

D. R. BROTHWELL

Dobzhansky, Th. *The Biological Basis of Human Freedom.* A Columbia Paperback. New York, 1960. Columbia University Press. (London, 1961, Oxford University Press.) Pp. 139. Price 10s.

THIS IS A book that anyone interested in eugenics would read with profit. Professor Dobzhansky is one of the creators of the science of population genetics. There are many people, he writes, to whom the idea that heredity is one of the determinants of the intellectual and emotional life of human beings is intensely distasteful. This is because of the tendency of the layman to think of inheritance in terms of the inheritance of property, and so to think of objects (i.e. characters) being inherited instead of potentialities. They consider, therefore, that to admit the importance of genetics implies a complete determinism of man's development. A similar misconception is, perhaps, the basis of the refusal of many medical practitioners to believe that illness is genetically determined because they feel that this is to admit that it can never be treated. The same error the author suggests is made by "racist" philosophers, among whom he unfairly classes Galton, on the basis of Galton's over-emphatic statements on the extent of the differences of the instincts and faculties of different men and different races.

The mirror image of this genetic determinism,

Professor Dobzhansky notes, is present in some of the environmentalist theories of character determination, which make much of swaddling and toilet training. He aptly classes this "diaper anthropology". He notes, too, similar determinism in psychoanalysis, but again is unfair to a great original thinker in writing that Freud refused to consider genetic differences. This is true of most of Freud's disciples, but not of Freud himself.

An individual's genetic constitution, the author stresses, may be realised in different ways in different cultures. But man's heredity and his culture are subject to evolution, fitting him to the environment. Here Professor Dobzhansky, in contrast to some of his contemporaries, makes clear the difference between short-term and long-term fitness. Natural selection may drive a group down a blind alley and cause it to become too specialised to survive the change in environment. It is a fallacy, therefore, to believe that mankind would be safe if only natural selection was permitted to operate: "in the near future man will probably have learned enough to influence the direction of evolutionary change in his own species by introducing well considered and agreed upon pressures of artificial selection". This will be a manifestation of human freedom.

C. O. CARTER

BIOLOGY

Mercer, E. H. *Cells and Cell Structure.* London, 1961. Hutchinson Educational. Pp. 100. Price 12s. 6d.

THIS IS THE second publication in a series of biological monographs published by Hutchinson. They represent excellent value for money. However, in the case of this particular monograph by Dr. Mercer, it seems unfortunate that such excellent material should not be enclosed within a more substantial binding; and to omit an index would seem to be a false economy.

Dr. Mercer has set out not only to describe basic morphology of cells, illustrated with some classical electron micrographs, but also to review current concepts about cell function. In a mere 100 pages and six chapters Dr. Mercer skilfully leads the reader through the various facets of cell structure, progressing to genetical aspects and the chemistry of the genetic apparatus. Readers with little or no experience of biochemistry or biophysics will find that this book explains in simple terms, which are intelligible to the non-specialist, such diverse concepts as the maintenance of cell membranes by the phospholipids and the chemical nature of the complex substances found within the cell nucleus. Indeed, this may be one slight fault of this publication—the over-simplification of certain biophysical aspects of the cell membrane: however, this will only serve to add to the book's universal appeal.

Dr. Mercer has the admirable accomplishment of reducing his text and using simple line diagrams to illustrate certain points. It is due to this method of presentation that so much information is imparted to the reader. An example of the use of simple diagrams is that showing the pattern of protein synthesis in a cell, showing "DNA molecules giving rise to RNA copies (messenger RNA's) which entering the cytoplasm, provoke the synthesis of structural proteins and enzymes. Protein synthesis takes place either on free RNA particles (ribosomes) or on particles associated with membranes to give rise to secretions."

The author does not assume any great biochemical knowledge on the part of the reader: for example, in describing the mitochondria we are smoothly introduced to high energy phosphate bonds and ATP. Indeed before describing the function of the mitochondrial enzyme systems, Dr. Mercer carefully informs us of what is meant by an enzyme, then, with the aid of a simple line sketch illustrates how the enzymes catalyse specific reactions by means of a molecule fitting snugly into its niche on the surface of the large enzyme molecule. It is the absence of unexplained technical jargon that makes this book refreshing reading.

The author even manages to give a brief account of the formation of cancer cells, postulating that these might be formed in circumstances where there is molecular injury to the DNA molecules or loss of parts of chromosomes, leading to a lack of apparatus which normally responds to the organism's